

CLIPPEDIMAGE= JP403209885A
PAT-NO: JP403209885A
DOCUMENT-IDENTIFIER: JP 03209885 A
TITLE: PIEZOELECTRIC BIMORPH ELEMENT

PUBN-DATE: September 12, 1991

INVENTOR-INFORMATION:

NAME

MATSUMURA, TAKENOBU

ASSIGNEE-INFORMATION:

NAME

UBE IND LTD

COUNTRY

N/A

APPL-NO: JP02003640

APPL-DATE: January 12, 1990

INT-CL (IPC): H01L041/09

US-CL-CURRENT: 310/330

ABSTRACT:

PURPOSE: To enable a piezoelectric bimorph element to reliably transmit an actuating action over a long time by a method wherein an electrical insulating band is provided onto a piezoelectric board to separate an action transmitting section from an electrode section.

CONSTITUTION: Two piezoelectric plates 1 and 4 and a shim material 7 are pasted together to constitute a piezoelectric bimorph element, surface electrodes 2a, 2b, 6a, and 6b are provided onto both the sides of the two piezoelectric plates, and action transmitting sections 3 and 5 are isolated from the surface electrodes 2a and 2b through an electric insulating band 10. By this setup, a metal film electrically conductive and abrasion-resistant such as an Ni metal film can be formed on the action transmitting section and the electrode section, a bimorph driving high voltage is prevented from

leaking to other
electric circuits or mechanical components even if an
actuated object is an
electrically conductive piece formed of metal, operating
parts are hardly cut
or broken down, and thus a piezoelectric bimorph element of
this design is able
to reliably transmit an actuator action over for a long
time.

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CLIPPEDIMAGE= JP403064081A
PAT-NO: JP403064081A
DOCUMENT-IDENTIFIER: JP 03064081 A
TITLE: PIEZOELECTRIC BIMORPH ELEMENT

PUBN-DATE: March 19, 1991

INVENTOR-INFORMATION:

NAME

MATSUMURA, TAKENOBU

ASSIGNEE-INFORMATION:

NAME

UBE IND LTD

COUNTRY

N/A

APPL-NO: JP01198034

APPL-DATE: August 1, 1989

INT-CL (IPC): H01L041/09

US-CL-CURRENT: 310/330

ABSTRACT:

PURPOSE: To prevent an actuator driving high voltage from leaking to other mechanical element or an electric circuit and to accurately transmit the operation of a piezoelectric bimorph element to an element to be operated for a long period by providing an electrically insulating ceramic unit on an operation transmitter of a piezoelectric ceramic plate.

CONSTITUTION: A piezoelectric bimorph element is composed by adhering piezoelectric ceramic plates 1A, 1B on which electrodes 3 are arranged, through a shim material 2. One end is secured by a securing member 5, and the other end is formed as an operation transmitting member in which an electrically insulating ceramic unit 4 of a small area is formed on a piezoelectric ceramic plate or an electrode on the ceramic plate. The ceramics include, for example, silica, alumina, silicon nitride, lead borosilicate glass,

etc. In order to
alleviate warpage of the ceramic plate after a thin film is
formed, the ceramic
material is preferably so selected as to reduce thermal
expansion coefficient
difference of the insulating ceramics and the piezoelectric
ceramic plates as
small as possible.

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